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Magnitude and Associated Factor of Acute Appendicitis among Adult Patient Admitted At Hawassa University Comprehensive Specialized Hospital in Surgical Ward

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Abstract

Introduction: Acute Appendicitis (AA) refers to severe inflammation of the vermiform appendix, which is because of obstruction of the lumen of the appendix due to the inefficient emptying into the colon. In most parts of the world, including Ethiopia, acute appendicitis is one of the major causes for which many patients undergo surgical intervention.

Objectives: The study aims to assess magnitude and associated factors of acute appendicitis among adult patients admitted to the surgical ward at Hawassa University Comprehensive Specialized Hospital, (HUCSH) Sidema region Southern Ethiopia.

Materials and Methods: Retrospective cross sectional study was conducted at HUCSH surgical ward and a review of all patient documents who present with acute appendicitis from July 2020 -Jun 2021. Data were abstracted from patient cards and registration books using structured Questioners. A bivariable and multivariate logistic regression model being used to determine predictors of AA. A p-value less than 0.05 were taken as a cut point to determine significant association.

Results: A total of 237 patients record were reviewed and all samples were taken as the study participants. The mean age of study participants was 27.99 ± 9.45 years then Median age group of patients was 26 years and they lie between 25 years and 34 years. Among the study

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participants the magnitude of AA was 36 (15.2%). The associated factors such as being male (AOR=0.39; 95% CI (0.18-0.83), Study participant having fecal impaction (AOR=0.02; 95% CI (0.01-0.06) and having intestinal parasite AOR=0.14; 95% CI (0.06-0.32) were significantly associated with the magnitude of AA.

Conclusion: The study revealed that the magnitude of AA from study participants was 36 (15.2%). In the current study associated factors like sex, residence fecal impaction and intestinal parasite were significant predictors of AA. So it requires timely designed and implemented medical intervention to reduce the incidence of AA.

Keywords

Magnitude; Acute Appendicitis; Associated Factors; Admitted Patients

Introduction

Acute Appendicitis (AA) refers to severe inflammation of the vermiform appendix, which usually results from obstruction of the lumen of the appendix due to inefficient emptying into the colon. It is the most common cause of acute inflammation in the right lower quadrant of the abdominal cavity and it is the most common cause of emergency abdominal surgery globally [1-3]. AA is a life-threatening condition that requires timely medical and nursing intervention to limit morbidity and mortality [4].

The vermiform appendix is considered by most to be a vestigial organ; its importance in surgery results only from its propensity for inflammation, which results in the clinical syndrome known as acute appendicitis [5-7]. Many cases require removal of the inflamed appendix either by laparotomy or laparoscopy, untreated mortality is high, mainly because of rupture leading to peritonitis and shock [8]. In Western countries and the USA the risk of developing acute appendicitis in one's lifetime is 8.6% for men and 6.7% for women [9-11].

General Hospital Oaxaca, Mexico abdominal pain is the most frequent symptom that occurs in patients, although other symptoms such as anorexia, nausea, constipation/diarrhea and fever are also described. Pain is typically per umbilical and epigastria, and later migrates to the lower right quadrant; however, despite being considered a classic symptom, migratory pain occurs only in 50 to 60% of patients with acute appendicitis. The appearance of nausea and vomiting occurs after the installation of pain, and fever usually manifests around six hours after the general clinical picture. This varies considerably from person to person, which in some cases is attributable to the location of the tip of the appendix [12].

Appendicitis occurs most commonly between the ages of 10 and 20 years and it has a male-to-female ratio of 1.4:1 in the United States [10]. Acute appendicitis is the most prevalent in low-

income countries [13]. Infection in the gastrointestinal tract, inflammatory bowel disease, parasites, low-fiber diet, high intake of refined carbohydrates, and fecal impaction [14]. Acute appendicitis can affect people of any age but is most common between the ages of 10 and 20 years. It is more common in males, although females are twice as likely to undergo an appendectomy [15].

Materials and Methods Study Setting

The study was conducted at Hawassa University Comprehensive specialized located 5.6 km from Hawassa center in the sideman regional state of South Ethiopia. Hawassa is the capital of Sideman regional located 273 km south of Addis Ababa, Ethiopia. Hawassa University Comprehensive specialized Hospital (HUCSH) was established and started its full function in November 2005. It is one of the referral hospitals in the region serving a teaching hospital for Hawassa College of Medicine and Health Science, with a catchment population of 18 million people and serves about 45,000 patients of all types per year. The Hospital has twelve departments, surgery is one of the departments where emergency and elective cases are admitted and managed. It provides a range of services such as outpatient, in-patient and emergency different departments namely: Internal Medicine, Surgery, Obstetrics and Gynecology, 8 OPD, Pharmacy, Medical Laboratory, and Radiology. Currently, Hawassa University Comprehensive Specialized Hospital has 350 beds and provides health services for more than 18 million people; and the number of staff the hospital that gives service is 1568 of which 995 are females and 573 are males. The hospital has an objective of providing health services, training different health professionals and conducting health research. The study was carried out at surgical ward.

Study Design and Period

Retrospective cross sectional study was conducted to assess the magnitude and associated factor of acute appendicitis among patients admitted at surgical ward in HCSH from July 2020 -Jun 2021.

Source Population

All surgical wards admitted patients at HUCSH during the study period.

Study Population

All admitted Patients with sampled in surgical ward from July 2020 -Jun 2021 at HUCSH.

Eligibility Criteria

Inclusion criteria: Medical record of all selected patients admitted in surgical ward during the study period.

Exclusion criteria: We excluded incomplete Medical records data.

Variable of the Study

Dependent Variables: Magnitude of acute appendicitis

Independent Variables: Socio demographic data, patient related factors and clinical symptom such as age, sex, residence, occupation, parasites, smoking, fecal impaction, fever, vomiting, nausea and abdomen pain.

Sample Size Determination and Sampling Technique

The sample size was determined using a single population proportion formula with the following Assumptions: estimate prevalence rate (31.48%) taken from a previous study conducted in Wolaita Sodo Teaching and Referral Hospital, with 95% confidence level, and 5% degree of precision [16]. The final sample size was 237. To recruit study participants systematic random sampling technique was used until the required sample size was obtained.

Data Collection

Socio-demographic data and other factors were collected from Secondary data by using patient's medical record of past 12 month (from July 2020-Jun 2021).

Data Quality Control

To ensure the quality of data, training was given for data collectors by Supervisors before starting data collection. Pre-tested was conducted to check its consistency, appropriateness, completeness and reliability of the questionnaire.

Data Processing and Analysis

Data were coded, entered and analyzed by using SPSS version 25 software. Data analysis involved descriptive statistics, including frequency, percentage, mean and standard deviations.

Binary logistic regression was used to see the association between dependent and independent Variables of the study participants. Those variables with p-value ≤ 0.25 on bivariate analysis was further considered for multivariate analysis to determine independent associations of each variable and to control confounding variables. Considered a statistically significant association is considered if P-value < 0.05 . Finally, data was presented by texts, graphs, tables and charts.

Results

Socio-demographic characteristics and other related factors

A total of 237 samples were taken in the surgical ward of HUCSH with a mean age of 27.99 ± 9.45 years then Median age group of patients was 26 years and all of them lie between 25 years and 34 years. The magnitude of acute Appendicitis was 36 (15.2%), among the study participants 165 (69.6%) were males, 165 (69.6%) of patients came from rural while 137 (57.8%) were low diet fiber 92 (39%) were intestinal parasite, 229 (96.6%) were per umbilical pain shifting the RLQ, 211 (89%) were vomiting, 72 (30.4%) were fever (Table 1).

Variables		Frequency	Percent %
Age	15-24 years	152	64.2
	25-34 years	73	30.8
	35-44 years	6	2.5
	45-54 years	6	2.5
	≥ 55 years	0	0
Sex	Male	165	69.6
	Female	72	30.4
Address	Rural	165	69.6
	Urban	72	30.4
	Farmer	60	25.3
Occupation	Merchant	53	22.4
	Student	86	36.3
	Civil servant	38	16
Fecal	Yes	137	57.8
Impaction	No	100	42.2
Smoking	Yes	38	16
	No	199	84
Diet	Low Diet Fiber	137	57.8
	High Diet Fiber	100	42.2
Intestinal Parasite	Yes	92	39

	No	145	61
Duration	=<24 hours	229	96.6
	2-3 days	8	3.4
Location of Abdominal Pain	Per umbilical pain shifting the	229	96.6
	RLQ		
	RLQ	8	3.4
	Unspecified site	0	0
Guarding	Yes	223	94.1
	No	14	5.9
Vomiting	Yes	211	89
	No	26	11
Nausea	Yes	184	77.6
	No	53	22.4
Fever	Yes	72	30.4
	No	165	69.6
Diarrhea	Yes	6	2.5
	No	231	97.5
Location Of	RLQ (McBurney's point)	217	91.6
Abdominal Tenderness	Unspecified	20	8.4
	Generalized	0	0
RLQ Mass	Yes	79	33.3
	No	158	66.7

Table 1: Socio-demographic characteristics and other related factors among patients admitted at HUCSH surgical ward, from July 2020 -Jun 2021 (N=237).

The Magnitude of Acute Appendicitis

Among the total 237 study patient card review the magnitude of AA was 36(15.2%) of them developed acute appendicitis while 201(84.8 %) of them did not develop acute appendicitis. (Fig. 1).

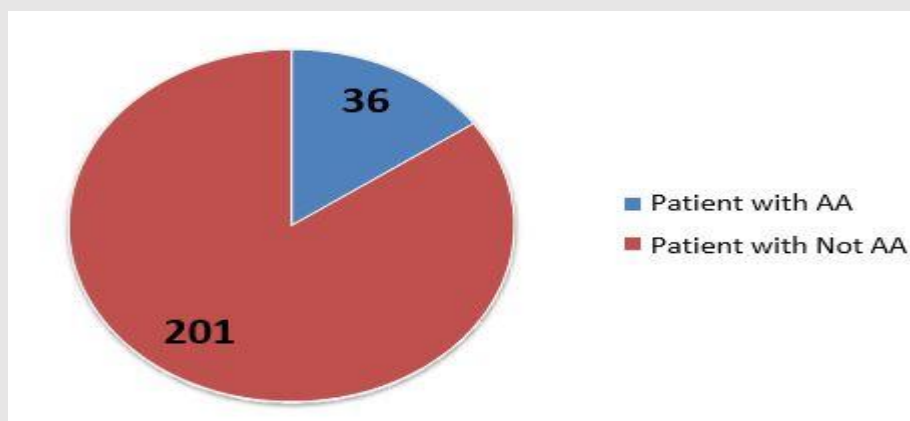


Figure 1: Magnitude of acute appendicitis patient admitted at HUCSH surgical ward, from July 2020 -Jun 2021 (N=237).

Factors Associated With Acute Appendicitis

In the binary logistics regression age of the patient, sex of the patient, address of the patient, fecal impaction, diet and intestinal parasite had an association with acute appendicitis (p -value <0.25). However, from all sex of the patient, address of the patient, fecal impaction and intestinal parasite were shown significant predictor of acute appendicitis (p -value <0.05) in multivariable logistic regression. (Table 2).

Variables	Categories	AA Infection		Bivariate Analysis		Multivariate Analysis	
		Yes	No	COR 95% C.I.	p-value	AOR 95% C.I.	p-value
Age of the patient	15-24	23	75	1.87 (.847--4.117)	0.121*	3.697(0.770--17.754)	0.102
	25-34	11	67	12.9 (1.679 --98.8)	0.014*	11.015(0.720--168.608)	0.085
	35-44	2	56	4.293(.535--34.43)	0.170*	4.801(.185--124.763)	0.345
	≥ 55	0	3	1		1	
Sex of the patient	Male	25	94	0.387(0.181--0.828)	.014*	0.198(0.049 --0.803)	0.023**
	Female	11	107	1		1	
Residence	Rural	25	81	0.387(0.181-0.828)	0.002*	0.083(0.021--0.334)	0.00**
	Urban	11	120	1		1	

Fecal impaction	Yes	26	74	0.018(0.006-0.055)	0.000*	0.005(.001-0.031)	0.000**
	No	10	127	1		1	
Diet	High	15	133	1		1	
	Low	21	68	0.365(0.177-0.753)	0.006*	1.181(0.331-4.212)	0.798
Intestinal parasite	Yes	14	16	0.136(0.059-0.316)	0.000*	0.113(0.025-0.516)	0.005**
	No	22	185	1		1	

Table 2: Associated factors among patient admitted at HUCSH surgical ward, from July 2020 - Jun 2021 (N=237) (COR: Crude Odds Ratio, AOR: Adjusted Odds Ratio, CI: Confidence Interval, N: number, 1: Reference).

Discussion

In the current study the overall magnitude of AA was 15.2%. This finding was similar to the study conducted in America, and Australia (16.0%) [6]. However, the finding of the current study was lower compared to the study conducted in South Africa (45.2%), Sudan (62.9%) and Ethiopia, at WUTRH (31.48%) [5,16]. The variation might be due to the socio-economic status of the country and area resulting in unable to life style.

In the current study different factors were significant predictors of AA. Among the study participants who were being male were 0.39 times more likely to affect by AA as compared to those study participants being female. The finding was in agreement with a similar study reported [12,16,17].

In the current study, the findings revealed that, among the study participants who were living in rural areas were 0.39 times more likely to affect by AA as compared to those study participants who live in urban areas. The current study figure was lower than similar studies reported in South Africa and Sudan [18,19]. This difference could be due to the difference in the study population and study setting.

In addition, the current study findings showed that, study participants who have fecal impaction were 0.02 times more likely to affect by AA as compared to those study participants who have no fecal impaction. The finding was in agreement with a similar study reported by (Nasim Ahmed).

In this current study the participants who have a history of intestinal parasites were 0.14 times more likely to develop AA as compared to those study participants who have no history of intestinal parasites. AA in agreement with others Nasim Ahmed (2021) [17]. In this study, patients having history of intestinal parasite were found to be 88.7% of times more likely to

develop AA as compared to patients were not having history of intestinal parasite. The finding was in agreement with the similar study reported by Nasim Ahmed [17-29].

Conclusion

The current study revealed that the magnitude of acute appendicitis was relatively low in our study area. It shows the magnitude of acute appendicitis is different from place to place. In relation to associated factors sex, place of residence, fecal impaction and intestinal parasite were significant predictor of the occurrence of AA. There is a need to design and implement an intervention to reduce the incidence of AA.

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Author Contributions

All authors participate on study design, data retrieval and capture, statistical analysis, manuscript writing, manuscript revision, editing and final approval.

Ethical Consideration

The study was approved by the institutional review board of Hawassa University, College of Medicine and health sciences. To review each patient's medical record permission letters and before data collection, informed consent were obtained from HUCSH. Privacy and confidentiality of each information were properly kept.

Conflict of Interest

Author declares no conflicts of interest.

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